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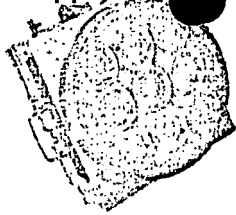
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*International Science and Technology*  
**Itek Trends/Optics**



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*July 1963*

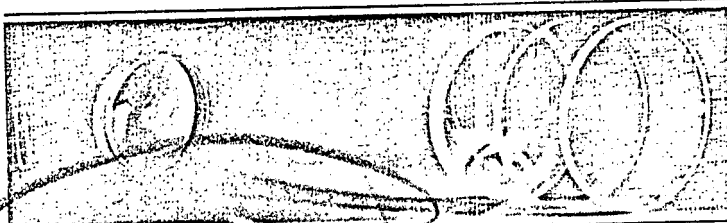
## COMMUNICATING THE EARTH'S "PULSE"



Each year, 125 seismic stations around the world record some 300,000 seismograms. These records are made by a galvanometer-mirror light-beam in response to movements within the earth. The resulting seismogram is a 1 x 3 foot recording of fine-line tracings on photographic paper having varying density and an average contrast level of 2:1. The unusual size and contrast of these records made reproduction impractical and seismologists were forced to work exclusively with original records. Because this method was so inefficient, the U.S. Coast and Geodetic Survey gave Itek Corporation the job of developing a solution.

An Itek information system is now the heart of a new Seismology Data Analysis Center operated by the Survey in Washington, D. C. The center of this system is a copy camera using a finite conjugate panoramic lens with a resolution of approximately 400 l/mm. It makes a 70mm microfilm recording of each seismogram in less than thirty seconds and simultaneously records an identification record in both human-readable, alpha-numeric and machine-readable binary code.

This camera is but one item in the information handling system, a complete description of which is available on request. We think it is interesting for two reasons. First, it describes Itek's capability to solve unusual problems in information technology through an interdisciplinary approach (optics and information sciences), and secondly, it shows an extension of an optical technique which, in recent years, has found its major use in aerial reconnaissance.



### LENSES

This photograph shows the six elements in one of our recent lens designs. Weighing under 20 pounds, it is a 24-inch, f/3.5 system which has consistently produced a resolution of 160 l/mm on SO132 film at a 2:1 contrast ratio. A similar design has most recently been used on a 66-inch F/4 system producing 140 l/mm at a 2:1 object contrast and we are in the process of testing a 40-inch system of the same design.

We have available a collection of data sheets on our most popular lenses — including the 240-inch, f/16 all-metal Cassegrainian Telescope. The data sheets are yours for the asking.

### SPECTRAL SIGNATURE

Based on the concept that all earth objects or conditions have a distinctive electromagnetic signature, a nine-lens camera system was designed as an aerial inspection instrument. The camera (top of page) is capable of photographing from 0.4 to 0.9 microns and with spectrometers, the system provides a coverage of spectral signatures from 0.4 to 5.0 microns. For information about the nine-lens camera or Itek's aerial photographic analysis center, contact West Coast Operations, 1450 Page Mill Road, Palo Alto, California. You may also be interested in the spectral sensor which Itek has developed and which is being offered for sale at \$18,500.

## FLYING SPOT SCANNERS

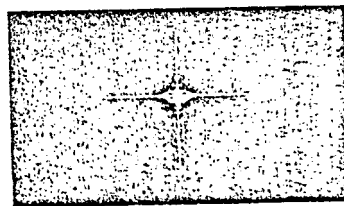


The scientists in our electro-optical research group are conducting studies to determine methods of counting human nerve cells electronically. Using Itek built UHR-CRT's and a microscope objective, they have devised a technique which uses 2000 scan lines with a frame presentation of 7 per second. Resolutions of 800 l/mm were obtained on the slide and magnifications of 400 diameters on the display.

The above photograph was made from a display showing a single cell micro-organism in a local untreated water supply. Other less unusual applications have included graphic readouts, spatial frequency analyzers, computer output and input, panoramic stereo rectification, spark and cloud chamber photo analysis and map reproduction and transmission systems.

## OPTICAL DESIGNS

This spot diagram of a triplet lens was generated in less than 10 seconds on the display console of a highspeed computer which is used in optical design work. In the previous 30 seconds, the computer generated and displayed the lens diagram showing pupil and image planes, meridional and sagittal ray traces and the modulation transfer function over a wavelength interval. This type of optical design programming allows the Itek lens designer to evaluate many alternate optical systems for optimum performance at minimum cost.



**Itek**

For complete information about Itek Trends/Optics, Contact Department IST-120

NRO review(s) completed.

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**Itek Corporation**

10 MAGUIRE ROAD, LEXINGTON 73, MASSACHUSETTS